MONITORING THE CHEMICAL AND BIOLOGICAL ENVIRONMENT OF THE CREW HABITAT IN SPACE

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Future space missions will require astronauts to live in an isolated, closed environment or habitat for many months at a time. Such a habitat will recycle air and water by chemical or biological means, or some combination thereof. It will be critical to monitor the environment for a number of possible hazards: slow buildup of trace chemicals released by any number of mechanisms; accidental release of hazardous chemicals; accidental release of hazardous biological material; or a change in the environmental ecology in a harmful direction.

The NASA Life Sciences Division has established the Advanced Environmental Monitoring and Control (AEMC) Program in order to encourage monitoring and control technologies which can benefit the crew habitat, and which take advantage of the modern techniques for miniaturization, as well as advancements in biotechnology. Because of the constraints of space flight, it is crucial that monitoring technologies be lightweight, small, low in power consumption, and low in maintenance and operation effort.

The AEMC Program has been in place for about 4 years. The program develops technologies through the following means: (i) funding of technology development through a peer-reviewed proposal process; (ii) tracking technology development in related fields and encouraging interactions; (iii) selecting candidate technologies for further ground and space flight development and testing.

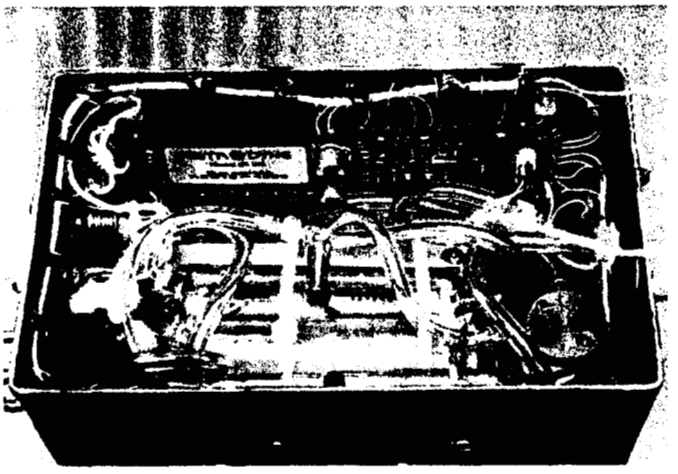

Figure 1. Interior view of an electronic nose for monitoring spacecraft air.